adscendentibus suboppositis utrinque 8–10. Petioluli ad 6^{mm} longi subtiliter puberuli. Petioli ad 2^{cm} longi. Paniculæ hornotinæ axillares glabræ. Capsula paulo latior quam longa, circiter 7^{mm} lata. Semina circiter 4^{mm} longa elliptica in sicco flavicantia. Embryo perispermio albo tenui inclusus, cotyledonibus carnosis basi cordulatis, radicula exserta subrotunda, plumula minima.

Species sicut subsequens ac tertia e Guatemala alio loco describenda semine perispermium includente radiculaque e cotyledonibus exserta a caeteris *Trichiliis* quorum fructus notus est discrepans.

Trichilia Colimana.—Foliis modice petiolatis 5–6-jugis, foliolis subaequalibus petiolulatis oppositis subalternisve lanceolatis basi leviter inaequali acutis apice acute acuminatis supra subtusque densius pilosulis, paniculis fructiferis simplicibus quam folia pluries brevioribus, capsulis pedicellatis 3- vel abortu 2-valvatis, valvis late ovatis transverse rugulosis hirsutis, loculis monospermis, seminibus subglobosis arillo aurantiaco circumdatis.—In Colima (*Palmer* 1,117).

Ramuli adulti glabri, in sicco rufescentes lenticellis pallidioribus inconspicuis. Folia ad 30^{cm} longa impari-pinnata. Foliola superiora caeteris parum majora ad 7.5^{mm} longa ad 22^{mm} lata in sicco firmule membranacea inconspicue subtiliter pellucido-punctulata, nervis secundariis subadscendentibus utrinque 10–12. Rhachis cum petiolo 7^{cm} longa teres pilosula. Paniculæ fructiferæ circiter 8^{cm} longæ. Capsularum valvae circiter 1^{cm} longae. Embryo intra sacculum persistentem extus perispermio pulverulente albo circumdatum inclusus, cotyledonibus carnosis ellipticis, radicula exserta brevi obtusa, plumula minima. —Casimir de Candolle, *Geneva, Switzerland.*

Frost freaks of herbaceous plants.—The very interesting article by L. F. Ward on "Frost Freaks of the Dittany"[1] called to my mind some very interesting observations which I made on this plant during the winter of 1885–6, while connected with the University of North Carolina. This plant is very abundant in the open woods at Chapel Hill where the University is located. During a short excursion one frosty morning the curious frost foils on the stems of *Cunila* attracted my attention. On these particular plants the frost laminations did not usually conform to the regular arrangement described by Mr. Ward, though sometimes the regular arrangement in whorls of two or four did occur. The sheets did however stand out vertically from longitudinal slits in the stem and were curved into multitudinous forms forming imitations of numerous objects. One case I particularly remember where two sheets issuing from parallel rifts quite near together, diverged as they extended outward from the stem, and then

[1] Botanical Gazette, **18:** 183. 1893.

gradually approached forming a perfect imitation of the shell of some lamellibranch. I found upon observation that the longitudinal bars on the sheets were due to slight inequalities in the thickness, caused by corresponding inequalities in the size of the rift in the stem. During the process of crystalization of the water at the surface of the cambium layer its expansion caused it to be expressed outward or vertically to the plant since this was the direction of least resistance to the forming ice foil. The forming crystal passing through the rift would be moulded into a fashion, so far as the thickness is concerned, corresponding to the inequalities of the rift. During the first stages of the crystalization frequently portions of the dead epidermis or periderm would be included, and as the foil extended outward considerable portions of the dead outer part of the stem would be carried out upon the terminal portion.

Although familiar with the frost freaks of *Helianthemum Canadense* from the statements in manuals, I had never seen them, and this phenomenon on the stems of *Cunila Mariana* seemed to me to be of some interest which would possibly justify some extended notice of it together with colored illustrations. Accordingly I engaged an artist friend to color in oil one of the most beautiful of the specimens. Since the frost work could not be taken in doors without fatal results to its form and beauty, and it would be rather chilly working at an easel in the frosty air of a cold morning, the object was placed just outside the window while the artist sat within. A very good picture was the result but further consideration of the subject led me to believe that the phenomenon was of such common occurrence throughout nature it was not worthy of the very dignified treatment which I had in mind at the start. So the matter dropped so far as I was concerned and this interesting phenomenon waited seven long years to be recorded.

Several mornings during that and following winters the frost marvels were observed, and each time also there occurred the well known phenomenon of the formation of ice columns in moist soil, where the crystallization of the surface moisture causes the forming crystal to expand vertically to the earth since that is the direction of the least resistance. Capillarity of the soil provides the constant supply from below where the soil is not frozen, and columns are pushed up several inches in height, carrying upon their summits portions of the surface soil and refuse matter in the way of leaves, etc. Warm or mild days and frosty nights, when the ground is not already frozen, favor both the formation of the ice columns in moist places on the ground, and the frost wings on the stems of the dittany. The peren-

nial root system probably does not supply by capillarity the constant stream of water as does the capillarity of the soil. But I do not think it unreasonable to suppose that there is a degree of root activity which furnishes the necessary water. The cold being superficial the water in the surface of the cambium crystallizes, the dead periderm cracks, and through the rift the nascent laminate crystal pushes its way.

A specific variation in the root activity of different plants as related to different temperatures explains, I think, why *Cunila Mariana* of all the plants Mr. Ward mentions forms the crystals. I discovered also one other plant which produced these frost freaks, but as the subject was losing what had seemed to me at first its very serious aspect, I did not take the trouble to accurately determine either the species or genus of this additional frost weed. From the observations which I made at the time I can safely say that it was either some species of *Eupatorium* or *Vernonia*, more likely the latter. I regret now that I did not accurately determine the species.—GEO. F. ATKINSON, *Botanical Department, Cornell University.*

A hybrid Baptisia.—Several specimens of a *Baptisia* have been collected in the vicinity of Manhattan which can not be referred to any of the species of the genus. The two species occurring here are *B. australis*, characterized by its glabrous foliage and erect raceme of blue flowers, and *B. leucophæa*, with hairy foliage and a reclining raceme of cream-colored flowers. The specimens referred to are intermediate in all these characters, even to the party-colored flowers, and are apparently hybrids between the two species. Fruiting specimens have not been observed.—A. S. HITCHCOCK, *Agricultural College, Manhattan, Kansas.*